### Assimilation Dynamic Network (ADN), Phase II

NASA

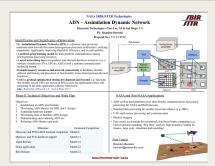
Completed Technology Project (2014 - 2016)

#### **Project Introduction**

The Assimilation Dynamic Network (ADN) is a dynamic inter-processor communication network that spans heterogeneous processor architectures, unifying components, significantly improving flexibility, efficiency, and overall usability. ADN has the following main features: - A uniform programming model for intra-platform communication among heterogeneous processing resources that creates a homogeneous programming environment. - A novel networking layer encapsulates and abstracts hardware resources (e.g. a mixture of multicore CPUs, FPGAs, ASICs) with a uniform communication method & format across the physical resources. - Extends memory resources and network connectivity to facilitate flexible, efficient partitioning and placement of functionality across the heterogeneous physical resources. -Enables gradual optimization during development and beyond, e.g. functions that initially ran on CPUs are moved to FPGA cores for optimization while still remaining in the same application software framework. Technical Objectives and Milestones for the Phase II project: - Establishing an ADN specification -Developing ADN libraries for HDL and C designs - Expanding hardware support for multicore CPU, FPGA and ASIC platforms - Developing tools to facilitate ADN designs - Demonstrating and evaluating ADN use in an example application - Releasing ADN libraries and tools

#### **Primary U.S. Work Locations and Key Partners**





Assimilation Dynamic Network (ADN)

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#### Small Business Innovation Research/Small Business Tech Transfer

## Assimilation Dynamic Network (ADN), Phase II

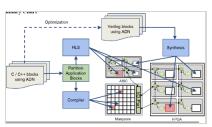


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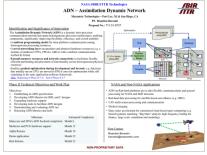
Organizations Performing Work	Role	Туре	Location
MaXentric Technologies, LLC	Lead Organization	Industry	Fort Lee, New Jersey
Goddard Space Flight Center(GSFC)	Supporting	NASA	Greenbelt,
	Organization	Center	Maryland
University of California-	Supporting	Academia	La Jolla,
San Diego(UCSD)	Organization		California

Primary U.S. Work Locations			
California	Maryland		
New Jersey			

#### **Images**



Final Summary Chart Image Assimilation Dynamic Network (ADN), Phase II Project Image (https://techport.nasa.gov/imag e/132177)



#### **Project Image**

Assimilation Dynamic Network (ADN) (https://techport.nasa.gov/imag e/126887)

## Organizational Responsibility

## Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

#### **Lead Organization:**

MaXentric Technologies, LLC

#### **Responsible Program:**

Small Business Innovation Research/Small Business Tech Transfer

## **Project Management**

#### **Program Director:**

Jason L Kessler

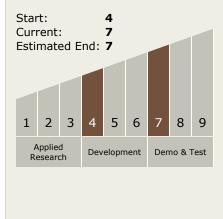
#### **Program Manager:**

Carlos Torrez

#### **Principal Investigator:**

Brandon Beresini

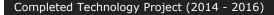
# Technology Maturity (TRL)





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## Assimilation Dynamic Network (ADN), Phase II





## **Technology Areas**

#### **Primary:**

- TX11 Software, Modeling, Simulation, and Information Processing
  - ☐ TX11.4 Information Processing
    - ☐ TX11.4.5 Cyber Infrastructure

## **Target Destinations**

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System

